
Math and Science Academy helps Native American schools empower teachers

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Los Alamos National Laboratory's Math and Science Academy (MSA) is a comprehensive professional development program for elementary- and middle-school teachers in participating northern New Mexico school districts. The program currently is supporting schools in seven pueblos—Jemez, Ohkay Owingeh (formerly San Juan), San Felipe, San Ildefonso, Santa Clara, Taos and Tsiya (Zia)—with much of the focus placed on increasing teachers' math and science knowledge and expertise in the practice of teaching.

"The teachers taking part in the MSA meet in three-week Summer Institutes for three consecutive years," said MSA staff member Zachary Leonard, "but we also offer additional opportunities, such as a Science Institute and an Ir-Rational Number Institute, which meet on Saturdays during the year. Perhaps most importantly, participants

receive ongoing support over the course of the three years through individual and peer coaching, content discussions and professional learning communities.”

Patrick Lewis, a Native American sixth-grade teacher at Jemez Day School, is in his third year in the MSA, and he also is enrolled in the University of New Mexico’s Educational Leadership master’s program with a Native American focus, a program started in partnership with the MSA.

Originally from the Tohono O’odham Reservation outside Tucson, Arizona, Lewis realized as a young man that many of his Native American peers ended up dropping out of school because they had not had a chance to have a positive educational experience.

Deciding to make a difference in Native American education, Lewis earned his first master’s degree and teaching credentials at Stanford University in California and taught public school in Pojoaque for two years and another two years in San Ildefonso Pueblo. He is now in his fifth year at Jemez Day School.

“I was in my third year at Jemez when my colleagues and I joined the MSA program,” Lewis explained. “My teacher training at Stanford was still recent enough to recall many of the pedagogical concepts and strategies, but the MSA gave me a focused opportunity to think deeply and to reflect on all the different aspects of teaching and assessing. To be able to do so on an ongoing basis while teaching at the same time is especially valuable since most other professional development opportunities tend to be one-shot deals.”

Enhancing the classroom experience

The MSA encourages Lewis and the other teachers to make each lesson interesting and fun and suggests a variety of engagement strategies. “The Kagan Strategies’ ‘Heads Together’ exercise, for instance,” Lewis noted, “brings students together to collaborate on a given problem or question.”

Gaining regular insight into whether students understand the concepts they are studying also is crucial to Lewis and his colleagues. “A strategic one- or two-problem exercise provides good assessment information,” Lewis said, “but one of the most powerful suggestions from the MSA team has been to regularly ask students to reflect in writing on what they are learning. The reflections can be fairly brief, but the students nonetheless often demonstrate a surprisingly keen sense of the significance of their lessons and what they still need to learn.”

As dedicated as Lewis is to his classroom work, he also realizes the importance of thinking about schools as a whole and how they shape the teaching environment. He already has added an administrative component to his studies and plans to begin an internship under the principal of Jemez Day School in January, with the goal of obtaining his administrative license.

“I would not have reached this point in my career without the MSA,” Lewis suggested. “During my first year in the program everything felt so valuable that I wanted to immediately implement all of it, which was overwhelming. During the second year, the information, suggestions and feedback that I received made a lot more sense. But it was not until my third Summer Institute this year that the various components—the science, the math, the pedagogy, and the broader perspectives on education—were really coming together for me.”

Zachary Leonard is impressed with Lewis' progress inside and outside the MSA. "Patrick is an example of a teacher who has chosen to go above and beyond what is necessary," Leonard said. "His passion and dedication to education and his willingness to develop his own knowledge and skills in order to make a difference in the lives of Native American children are admirable."

To learn more about the Math and Science Academy, visit the [Northern New Mexico Math and Science Academy](#) website, consult a related [program overview](#) (pdf) and listen to the "What is the Ir-Rational Number Institute" and "Teaching Science to Teachers" podcasts on the [Soundcloud](#) podcast site.

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